

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



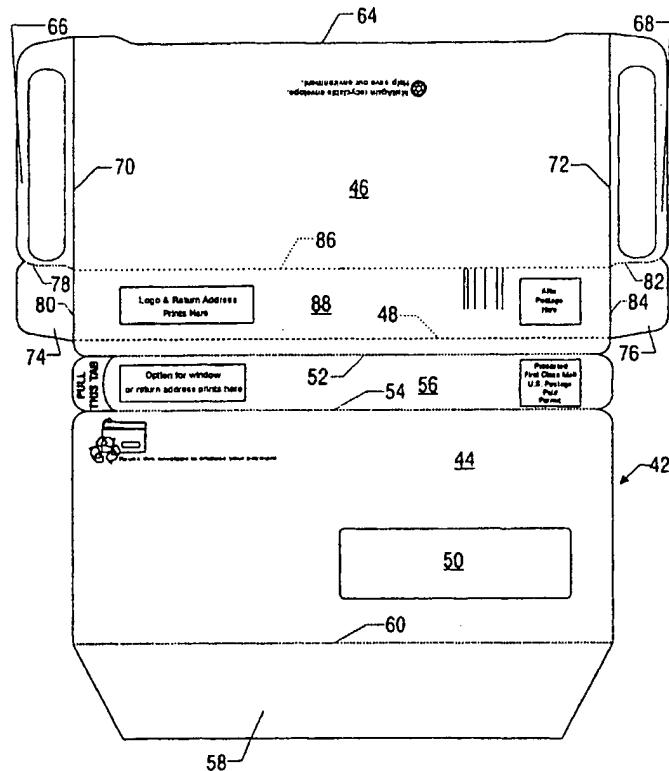
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B65D 27/06		A1	(11) International Publication Number: WO 00/10885
			(43) International Publication Date: 2 March 2000 (02.03.00)
(21) International Application Number:	PCT/US99/19129		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
(22) International Filing Date:	24 August 1999 (24.08.99)		
(30) Priority Data:	60/097,575	24 August 1998 (24.08.98)	US
(71)(72) Applicant and Inventor:	EMMOTT, Gary, G. [US/US]; Unit E, 1114 Nantucket, Houston, TX 77057 (US).		
(74) Agent:	DURKEE, William, D.; Arnold White & Durkee, P.O. Box 4433, Houston, TX 77210 (US).		

(54) Title: REMAILABLE ENVELOPE

(57) Abstract

A remailable envelope contains a tear strip (56) across its upper front face (44) which can be removed to allow the contents of the envelope to be reached and removed. A resealing flap (88) on the back (46) of the envelope allows the recipient to fill the envelope again and then fold over the resealing flap to affix it against the front face below where the tear strip was removed.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LJ	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

REMAILABLE ENVELOPE

This application claims the benefit of prior filed copending U.S. Provisional Application No. 60/097,575 filed 08/24/98.

FIELD OF INVENTION

5 This invention relates to envelopes, particularly envelopes which are suitable for reuse after the first transmittal by detaching one or more selected portions of the original envelope prior to the second transmittal.

BACKGROUND

A remailable envelope offers many benefits and savings due to the efficiencies resulting
10 from the elimination of an additional return envelope which the recipient must have or which must be included in the original mailing. A remailable or two-way envelope is an envelope that serves as both the outgoing and return envelope. A remailable envelope is formed in such a way that when opened it forms another envelope to be used for the return. What might appear as a simple envelope, however, has many factors that control the design, manufacturing, and
15 marketability of the product.

Envelopes produced at high volumes are most efficiently produced on web envelope presses. From a blank roll of paper this type of equipment has the ability to print both sides in multiple colors, die cut, and attach window material, and form a finished envelope at speeds from thirty thousand to eighty thousand per hour. In line finishing also includes pattern
20 perforation and application of glue or other adhesive.

The present envelope design is the result of an intensive study of the automated mail processing technology in the envelope manufacturing industry including web manufacturing, mail inserting, postal processing, bar code sorting, and statement processing equipment. The main objective of the research was to formulate the set of criteria by which a one envelope
25 system would be economical, efficient, and useful. There are five points that resulted from the study. The first point is that the envelope should be designed to be manufactured on high speed web equipment. The second point is that the envelope should be constructed as an open side -- side seam envelope which allows easy insertion and sealing and which permits even stacking. The third point is that the envelope design should be flexible as to the location and size of the
30 address window in order to accept various designs of the mailed material and to meet automated

mail processing requirements. This flexibility minimizes the modifications or adjustments necessary to the existing statements or mailed material. The fourth point is that the envelope should meet all published postal standards and regulations, including bar code sorting. The fifth point is that the remailable envelope should be user friendly. In accordance with the invention, 5 the envelope is a simple two-step envelope which is easy to open and easy to reseal. Efforts to provide envelopes and mailing devices for multiple use are illustrated in several prior patents. US Patent No. 4,775,095 describes an improved inside side seam envelope which has a detachable section on the face of the envelope. US Patent No. 4,334,618 describes a snap open envelope in which the opposed ends are pulled apart to provide a portion which serves as an 10 envelope and which has an enclosure flap where instructions for use or notification can be applied to the flap and readily seen upon opening the original envelope. US Patent No. 3,498,528 describes a remailable envelope having a first panel with a gummed top flap narrower than the width of the envelope and another panel having a sealing flap which folds over onto the top flap. US Patent No. 4,403,696 describes a prestuffed mailing envelope that has a removable 15 tear strip at one envelope end. US Patent No. 3,874,582 describes an envelope having a detachable top flap.

The remailable envelope in accordance with the present invention avoids the need for enclosing a second envelope within a first envelope. The remailable envelope avoids the cost of manufacturing the second envelope and avoids the need to spend time and effort in inserting the 20 second envelope within the first envelope to be mailed to the addressee. A remailable envelope also avoids having to dispose of the first envelope as trash when using a second envelope.

DISCLOSURE OF THE INVENTION

The current invention includes an easy open tear strip that serves as an inviting way to open an envelope easily without a letter opener. This tear strip preferably includes return 25 address information and the initial postage markings or mailing permit which is removed when the tear strip is removed from the envelope. The invention also includes additional scores, glue areas, and perforations that along with the easy open tear strip form a reusable mailing envelope or carrier envelope that is designed to serve as the outgoing and return envelope or housing device for response correspondence and mailings. When the initial recipient tears the tear strip 30 from the envelope, the remaining envelope may be used to form an envelope or carrier for the

return correspondence or mailing. The easy open tear strip is made with parallel tearable scores or perforations on the front face panel. Preferably, the lateral ends of the parallel scores extend into notches that form tabs in the lateral edges of the tear strip to facilitate opening. The front face panel is foldably connected to a back face panel along a foldable score. The front face panel or the back face panel preferably include side seam flaps along their lateral edges to seal against the other panel when folded inwardly and against the other panel. An initial seal flap may be included at the outward edge of the front panel or the back panel to fold over the other panel for the initial mailing.

The outer edge of the panel which does not contain the initial seal flap preferably has a reduction of paper along the edge forming the entrance to the inside of the envelope, called a throat, which helps in the insertion of contents into the envelope by mechanical or manual action. In addition, the throat can save paper and weight since the amount of paper is reduced to form the throat.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the sheet forming the basic envelope with an easy open tear strip design and an initial seal flap on the back panel.

FIG. 2 is a front view of the basic envelope with easy open tear strip and the initial seal flap on the front face panel.

FIG. 3 is a front view of a remailable envelope with initial seal flap on the front face and a resealable strip on the back face for remailing.

FIG. 4 is a back or inside view of the envelope illustrated in FIG. 3.

FIG. 5 is a front view of a remailable envelope with initial seal flap on the back panel.

FIG. 6 is the back or inside view of the envelope illustrated in FIG. 5.

FIG. 7 is a remailable envelope designed for business reply applications with initial seal flap on the front face panel.

FIG. 8 is a front or outside view of an overnight envelope/carrier with initial seal flap on the back panel.

FIG. 9 is a back or inside view of the send and return overnight envelope/carrier illustrated in FIG. 8.

FIG. 10 is an outside or front view of a send and return overnight envelope/carrier with initial seal flap on the back panel.

FIG. 11 is an inside or back view of the send and return overnight/carrier illustrated in FIG. 10.

5 **DESCRIPTION OF PREFERRED EMBODIMENTS**

With reference to FIG. 1, an envelope is shown in the form of a sheet 10 prior to folding before forming the envelope. The sheet 10 contains a front or address panel 12 and a back panel 14 foldably connected along a score line 16. The address panel 12 includes an address window 18 which can be made in accordance with conventional procedures. Just below the foldable score 16 on the front panel 12 are a pair of tearable scores or perforations 20 and 22 which define a tear strip 24 extending across the address panel 12. The tear strip 24 may include information like "pull this tab" noted at 26. The address panel may also include instructions about opening such as the information shown at 28. The tear strip 24 preferably includes the return address information as well as the postage or mailing permit for the initial mailing. Thus, 10 when the tear strip 24 is removed, the initial postage information and the original return address are removed from the envelope. The back panel 14 includes at its lateral edges side seam flaps 30 and 32. Back panel 14 also includes initial sealing flap 34 which includes an adhesive on its backside to fold over the throat 36 on the lower edge of the address panel 12. Side seam flaps 30 and 32 contain glue areas 38 and 40 which when folded inwardly seal against the back of the 15 address panel 12. Thus, when the back panel is folded against the back of the address panel 12 with the side seam flaps 30 and 32 folded inwardly, an envelope is formed with the opening 20 into the envelope located at throat 36.

After the envelope is filled with its contents, initial sealing flap 34 may be sealed against the front of the address panel 12 below the address window 18 to form the mailable envelope. 25 Upon receipt, the recipient can open the envelope by simply pulling tear tab 24 and removing the contents. Notches 19 and 21 are formed in the lateral edges of front panel 12 at the ends of perforation 20 to facilitate removal of the tear strip 24. Notches 23 and 25 are similarly included at the ends of perforation 22. These notches at the starting points of the tear strip define the tear strip better and make removal easier.

With reference to FIG. 2, the basic envelope is shown with the initial seal flap 35 foldably connected to the address panel 12. The throat 37 is on the outer edge of the back panel 14. This envelope is similar to the envelope of FIG. 1 except that the initial sealing flap is on the different panel and the throat is on a different panel as well as the address window 19 is in a 5 different location from the address window 18 in FIG. 1.

The initial seal flap 34 will usually have one of three affixing options. It can have a spot area that is coated with remoistenable glue. It can have two spot areas coated with latex glue that will bond when one contacts the second area of latex glue on the opposite panel or fold out flap on the opposite panel. It can have a peel off tape adhesive strip. The initial seal flap can 10 extend from the front panel that forms the face of the envelope and fold over to adhere to the lower portion of the back panel of the envelope. Or it can extend from the back panel of the envelope and fold over to adhere to the lower face of the front panel.

FIG. 3 is a front or outside view of a sheet 42 for forming a remailable envelope. The back or inside view is illustrated in FIG. 4. With reference to both of these figures, sheet 42 15 contains an address panel 44 and a back panel 46 foldably connected along a score line 48. An address window 50 is included in the address panel 44 and the upper part of the address panel 44 contains parallel scores or perforations 52 and 54 to make tear strip 56 across the top of the address panel 44. The tear strip 56 contains the return address information and the postal information. Instructions are included on how to open the envelope in a manner similar to FIGS. 20 1 and 2. Initial sealing flap 58 is foldably connected to address panel 44 along a foldable score line 60. Initial sealing flap 58 contains glue 62 on its back surface for folding over the throat 64 on the outer edge of the back panel 46. Side seam flaps 66 and 68 are foldably connected to back panel 46 along score lines 70 and 72. Side seam flaps 66 and 68 each contain tear tabs 74 25 and 76 which are attached to the side seam flaps 66 and 68 by means of tearable scores or perforations 78, 80, 82 and 84. The back panel 46 also contains a foldable score 86 to form a resealable flap 88. The backside of flap 88 contains a glue strip 90. The front side of the foldable strip 88 preferably contain return address information of the mailing company as indicated in FIG. 3, a logo of the mailing company, and postal information including directions for the location of postage. Thus, when the envelope has been stuffed with its contents for initial 30 mailing, the sealing flap 58 is folded over the back panel 46 passed throat 64 and is sealed against the back panel 46 by the glue strip 62. Upon receipt of the mail, the recipient simply

pulls the tear tab 56 to open the envelope and remove the contents. The recipient can then place the return contents such as a statement or check in the envelope passed the opening caused by removal of the tear strip 56. At this point, the foldable strip 88 is then folded along the score line 86 and the glue 90 seals the return envelope closed against the upper front face of the address panel 44.

The remailable envelope illustrated in FIG. 5 and FIG. 6 is similar to that of the one in FIG. 3 and FIG. 4 except that the throat 65 is part of the address panel 44 and the sealing flap 59 is attached to the back panel 46 by foldable score 61. Glue strip 63 is located along the back edge of sealing flap 59 and glue strip 90 is located near score line 48 on the backside of foldable strip 88.

FIG. 7 illustrates an embodiment of a remailable envelope employing business reply mail. This envelope is the same as the one illustrated in FIG. 3 and FIG. 4 except that business reply information is attached to the foldable strip 88 and postal reply information including postal bar codes shows through an enlarged window 92 for remailing. In the particular case illustrated, the window 92 extends across the score 60 onto the resealing flap 65.

FIG. 8 is a front view of an overnight send and return carrier. The carrier 100 has a front panel 102 and a back panel 104 foldably connected along a score line 106. A tear strip 108 is formed on the front panel 102 by two tearable scores 110 and 112 across the front panel near the score line 106. Front panel 102 has a sealing flap 114 foldably connected to it along foldable score line 116. Side sealing flap 118 is foldably connected to back panel 104 along score line 120. Side sealing flap 122 is foldably connected to the back panel 104 along score line 124. The top outer edge of back panel 104 has a throat 126 recessed into the outer edge of the back panel 104. Back panel 104 also contains a foldable score line 128 and a removable tab 130 on one side of the back panel 104 and a removable tab 132 on the other side of the back panel 104.

Removable tab 130 has a tearable score or perforation 134 and another tearable score or perforation 136 to facilitate removal of tab 130 upon resealing. Removable tab 132 has a tearable score 138 and another score 140 to facilitate removal of tab 132 from the edge of the back panel. Back panel 104 can include a company logo or other information printed on it. The score 128 when folded forms a closure strip 142 after removal of tear strip 108 to reseal the overnight carrier. The front panel 102 can be used to contain the usual routing information used by overnight carriers.

FIG. 9 illustrates the inside or back view of the overnight carrier illustrated in FIG. 8. Adhesive 144 is on the sealing flap 114 and adhesive 146 is on the back of resealing flap 142. Adhesive 119 is also on the front side of the side sealing flap 118 and adhesive 123 is on the front side of the side sealing flap 122 to seal the side edges of the overnight carrier when the flaps 118 and 122 are folded inwardly and then the carrier is folded along score line 106 to stick the flaps 118 and 122 to the backside of the front panel 102.

FIG. 10 illustrates a front or outside view of another overnight carrier. FIG. 11 illustrates the back or inside view of the overnight carrier illustrated in FIG. 10. Overnight carrier 150 has a front panel 152 foldably connected to a back panel 154 along score line 156. Front panel 152 has a tear strip 158 formed near score line 156 by two tearable scores or perforations 160 and 162 which are parallel to form the tear strip 158 across the top of the front or address panel 152. Front panel 152 also includes throat 164 recessed into its bottom edge to facilitate insertion of material inside the overnight carrier 150. Back carrier 154 has a side sealing flap 166 foldably connected to back panel 154 along score line 168. Side sealing flap 166 includes adhesive 170 to seal against the backside of panel 152 when the side sealing flap 166 is folded inwardly and placed against the back panel 152. Side sealing flap 172 is connected to back panel 154 along score line 174 and contains glue or adhesive 176 for sealing against the front panel 152. Back panel 154 also contains an initial sealing flap 178 which contains an adhesive 180 on its backside. Initial sealing flap 178 when the sheet is folded along score 156 can be folded over the throat 164 and sealed against the front of the front or address panel 152.

Back panel 154 also contains a foldable score 182 which is parallel to score 156 to form a flap 184 for resealing the carrier after the tear strip 158 is removed. Resealing flap 184 contains glue or other adhesive 186 on its backside to seal against the front of front panel 152. A removal tear tab is formed near the resealable flap 184 to facilitate resealing. Tear tab 186 is formed along side sealing flap 166 by perforation 188 which runs from a notch 190 in the side sealing flap to near the end of score 182. Perforation 192 is along the side sealing flap 166 near the resealing flap 184 to facilitate removal of tab 184. Similarly, removal tab 194 is at the other end of resealing flap 184 and is formed by a notch 196 in the side sealing flap 172 with a perforation 198 running from the notch 196 to the score line 174. Removable tab 194 also contains a tearable perforation 200 perpendicular to the resealing flap 184. Tearable perforation 200 is an extension of the foldable score 174 past the resealing flap 184. Thus, the overnight carrier sheet

can form the carrier by folding the side sealing flaps 166 and 172 inwardly and then folding the sheet along score line 156 to stick the side sealing flaps 166 and 172 against the backside of front panel 152 along the sides by means of adhesive 170 and 176. Contents for the carrier can be then inserted past throat 164 into the inside and then the carrier can be sealed by initial sealing 5 flap 178 folded over the throat 164 to seal against the front side of the front panel 152 by means of adhesive 180.

The carrier may be opened by the recipient by tear tab 158 for removal of the contents. Contents can then be replaced in the carrier and the carrier sealed by folding the resealable flap 184 along score line 182 over the top edge of the front panel 152. Resealing flap 184 will adhere 10 to the front panel 152 by means of adhesive 186.

Although glue is shown on the side sealing flaps in the various embodiments, glue, other adhesive, or peel off tape covered adhesive could be placed on the panel to which the side sealing flaps stick. In addition, the side sealing flaps could be formed along the sides of the front or address panel if desired. Various other changes can be made without departing from the spirit 15 of the invention. The construction can be light or heavyweight papers or synthetic materials.

The easy open pull strip allows the recipient to open the envelope quickly. A two-way mailing envelope with a window or windows to display the addressee information for both the outgoing and return mailings is provided. Removal of the tear strip also allows the markings with the outgoing postage to be removed. The envelope can be used for statement mailings, direct mail 20 solicitations, business reply mailings, surveys, etc. The envelope can have an attached plastic enclosure affixed to the outside that displays the addressee/processing information or a two-way address/shipping label that can be affixed to the outside of the carrier. The carrier envelope is normally for larger envelopes around nine inches by twelve inches or larger and may be constructed of thicker more durable materials such as cover weight papers, plastic, or synthetic 25 materials. This application can serve as a reusable carrier for response correspondence through overnight carriers. The side seal flaps optionally could be replaced with welded side seams or glued side seams without the flaps. Heat sealable plastic could also be used to form the welded side seams. Similarly, the initial sealing flap could be formed by a welded seam after the contents are placed in the envelope.

CLAIMS:

1. A sheet for forming an envelope, which sheet comprises:
 - a) an address panel connected to a back panel by a first foldable score;
 - b) parallel tearable scores across the address panel near the foldable score to form a tearable strip to permit opening an envelope;
 - c) foldable side seam flaps on the lateral sides of the back panel or address panel to seal against the sides of the other panel when folded inwardly and placed against the other panel;
 - d) an initial seal flap foldably connected to the outside of the address panel or the back panel to fold over the other panel and seal against it when forming an envelope.
2. The sheet of claim 1 in which the back panel contains a second foldable score to form a foldable strip for resealing an envelope after the tearable strip is removed.
3. The sheet of claim 2 in which the side seam flaps are on the back panel and contain tearable scores extending from near the second foldable score across the flaps to form removable tabs to permit removal of the tabs when resealing an envelope with the foldable strip.
4. The sheet of claim 1 in which the outward edge of the address or back panel on the opposite side from the initial seal flap has a notch across it to facilitate insertion of material in the envelope prior to folding and sealing the initial seal flap.
5. The sheet of claim 1 in which the side seam flaps and the initial seal flap contain an adhesive.
6. The sheet of claim 5 in which the foldable strip contains an adhesive.

7. The sheet of claim 6 in which the adhesive on the side seam flaps is on one side of the sheet and the adhesive on the initial seal flap and the foldable strip is on the other side of the sheet.

8. The sheet of claim 1 in which the address panel includes a transparent address window.

9. The sheet of claim 1 in which a return address is printed on the tearable strip.

10. The sheet of claim 9 in which the tearable strip contains postage information or location for initial mailing.

11. The sheet of claim 2 in which the foldable strip contains printing for a return address and location information for postage.

12. An easy open envelope comprising:

a) a front panel attached to a back panel to form an envelope;

b) parallel tearable scores across the front or back panel near an edge to form a removable strip to permit opening the envelope;

c) the removable strip having a pull tab at one or more of its ends formed by notches in the edge of the panel which meet with the ends of the parallel tearable scores.

13. The envelope of claim 12 in which the notches have curved sides and the pull tab has an arcuate shape.

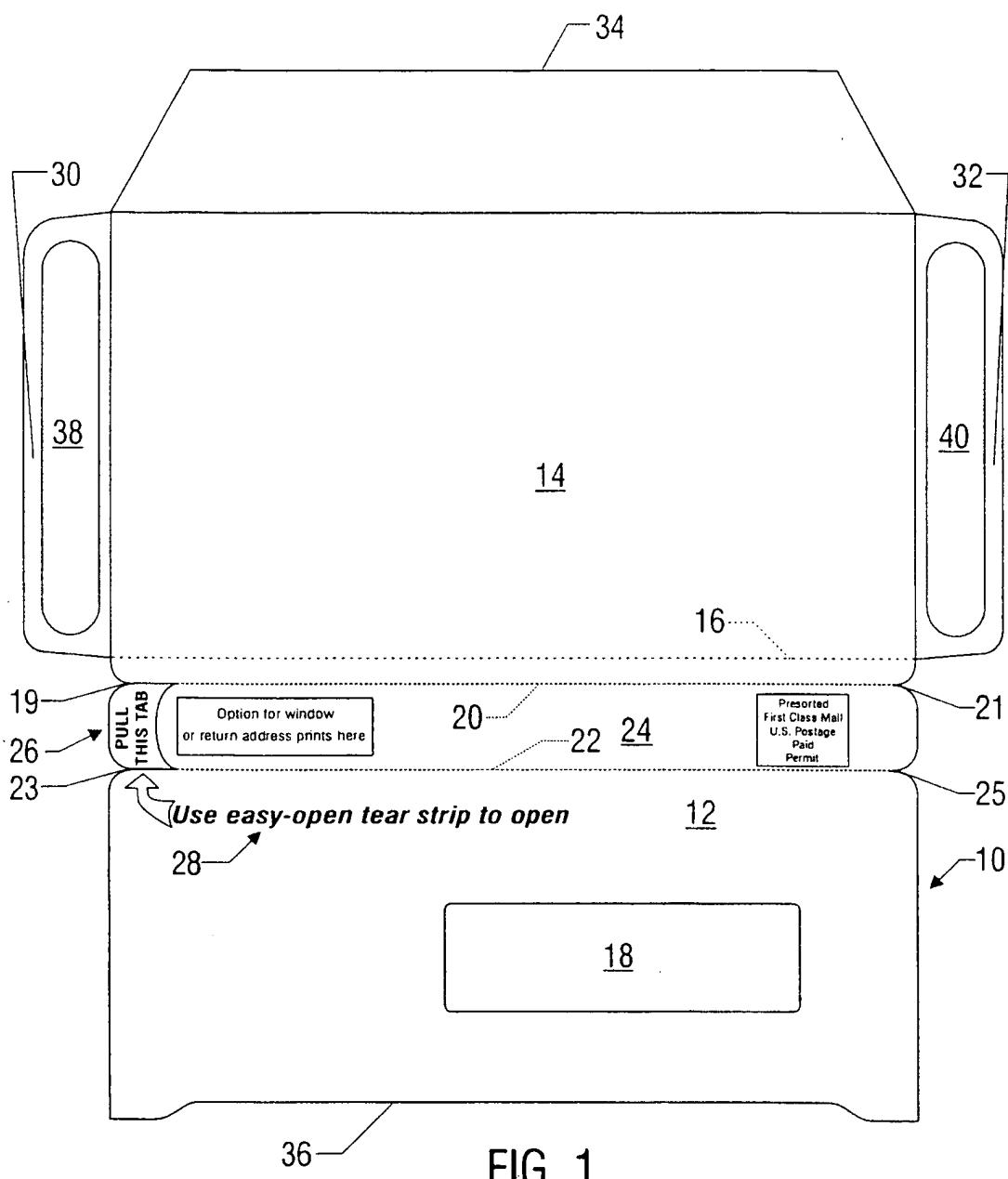


FIG. 1

2/11

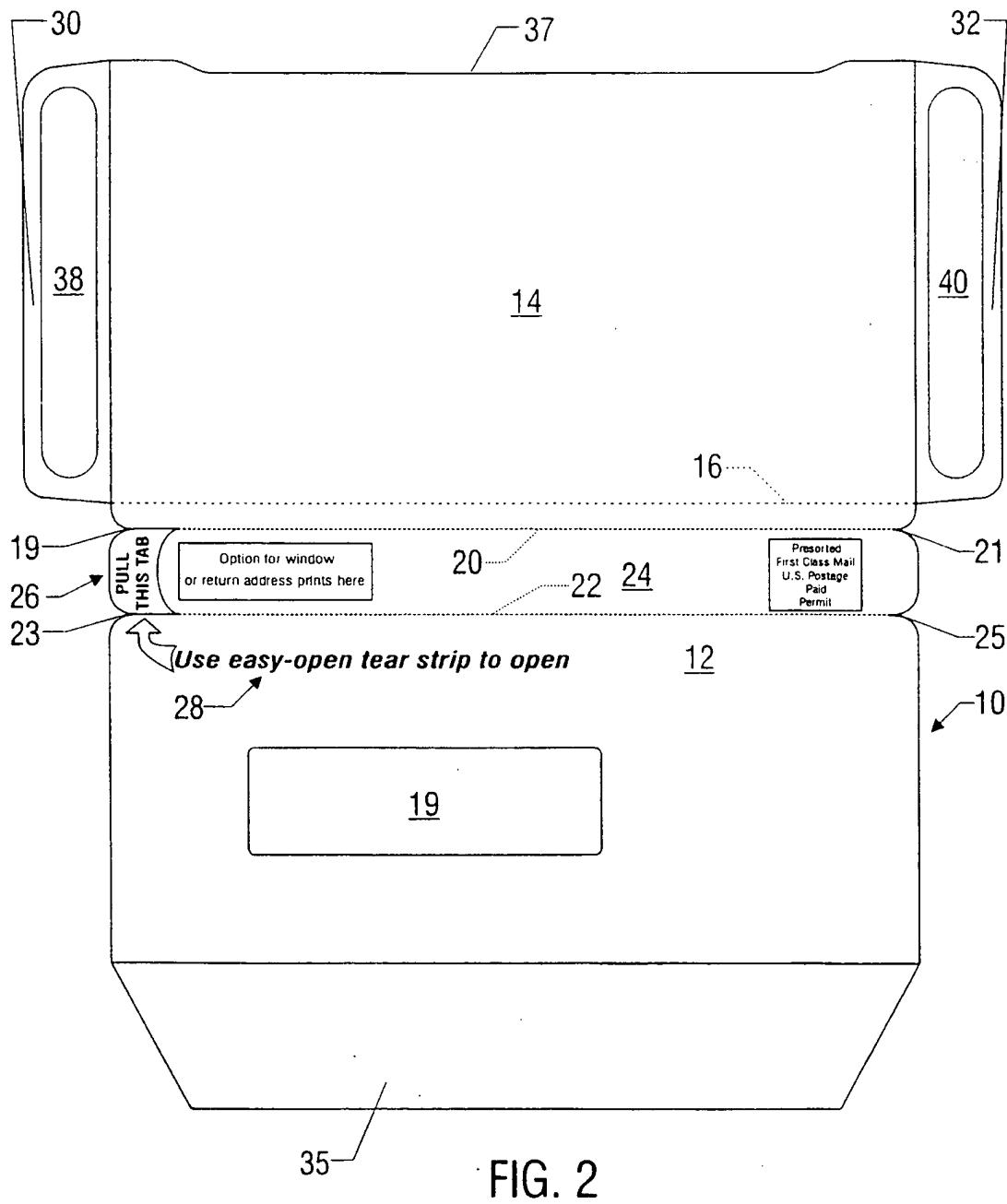
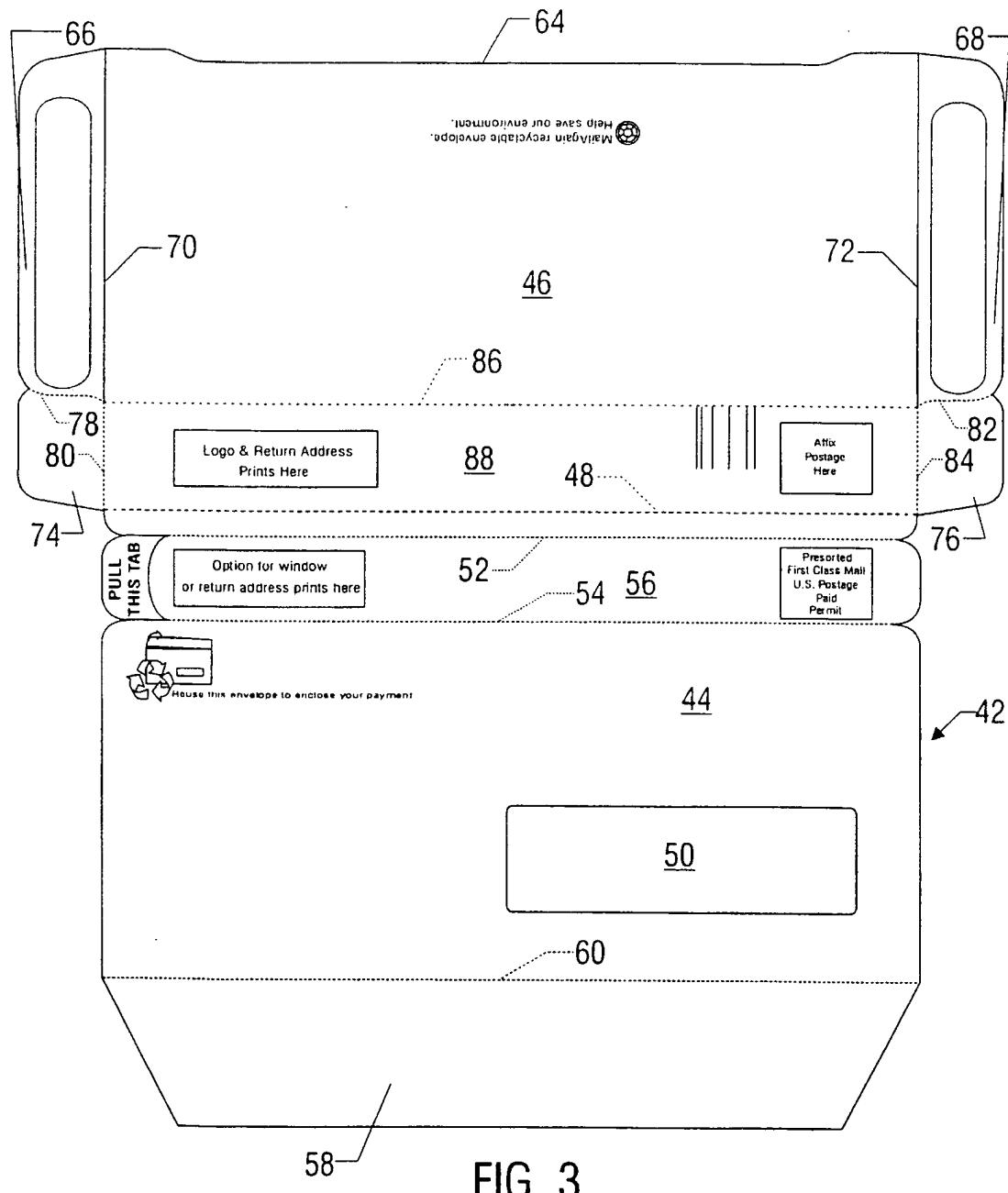


FIG. 2

3 / 11



4 / 11

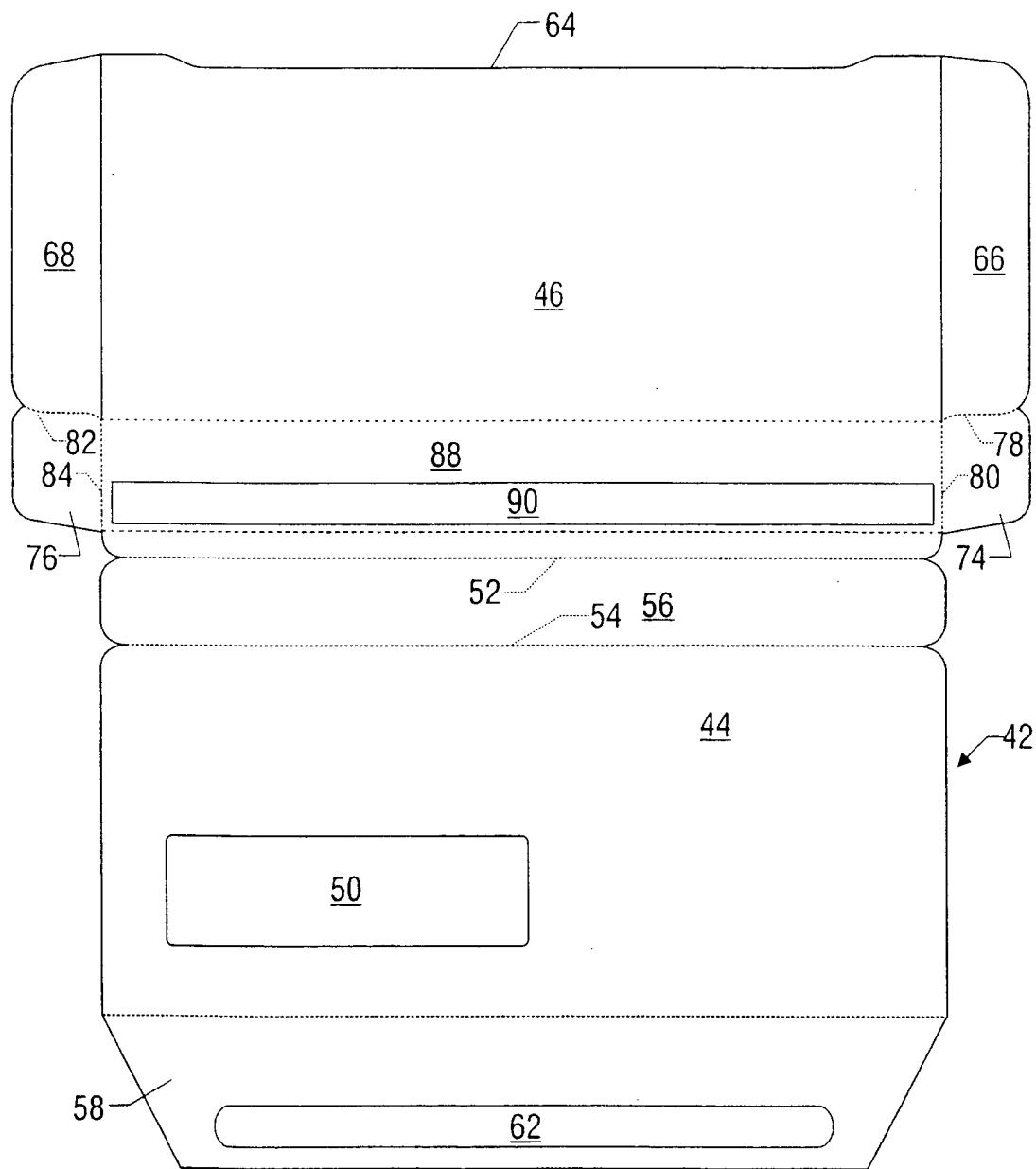


FIG. 4

5 / 11

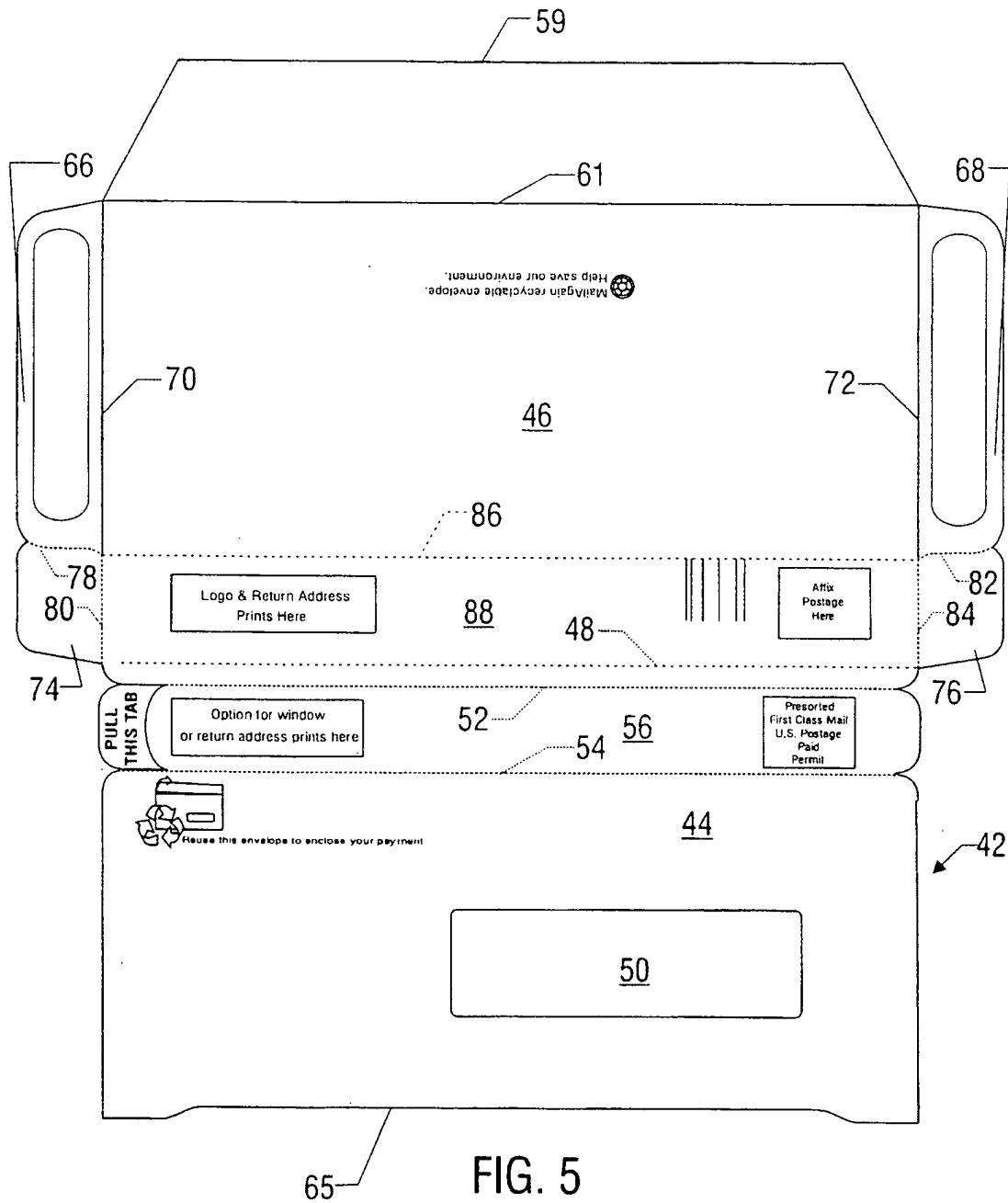
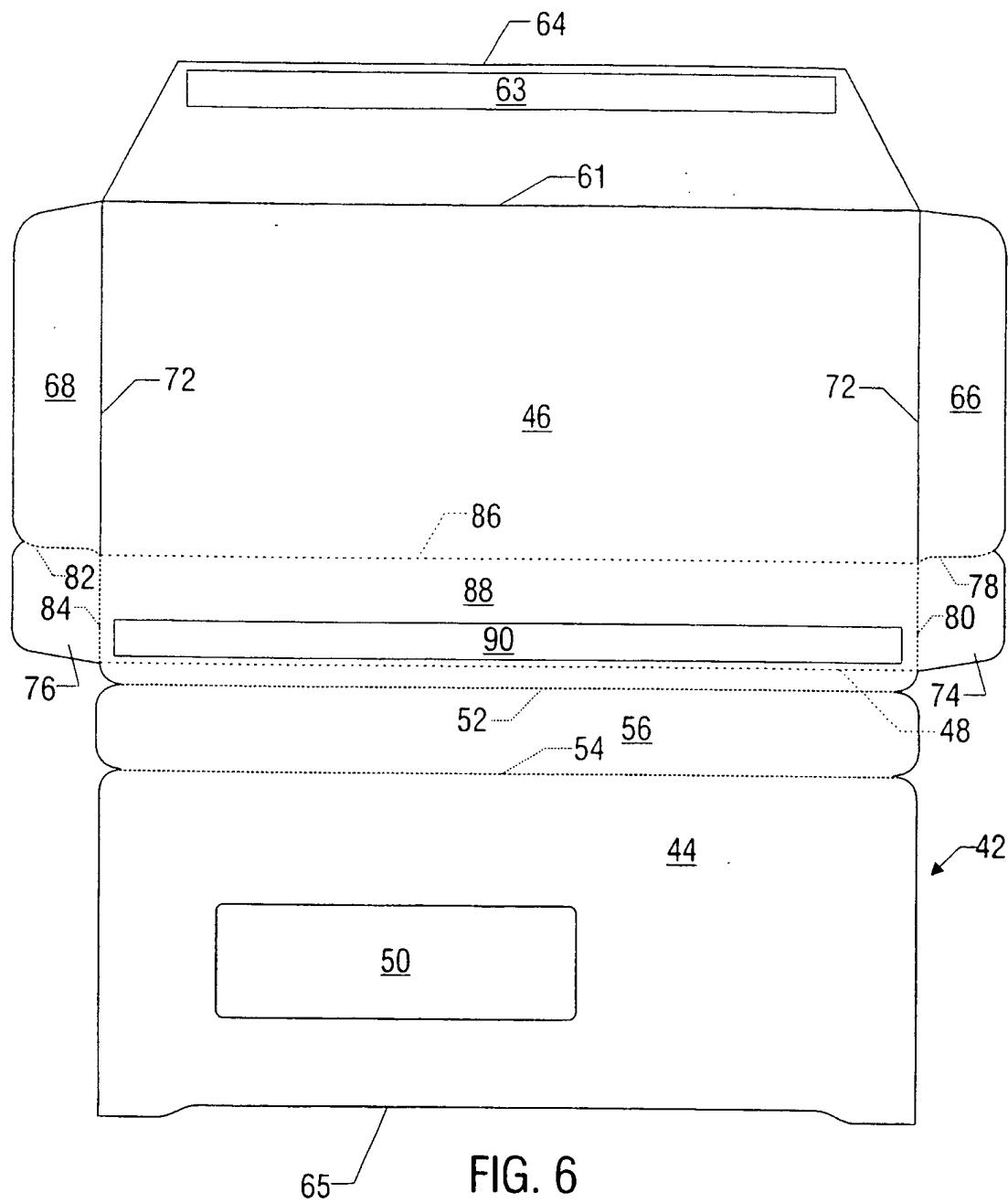
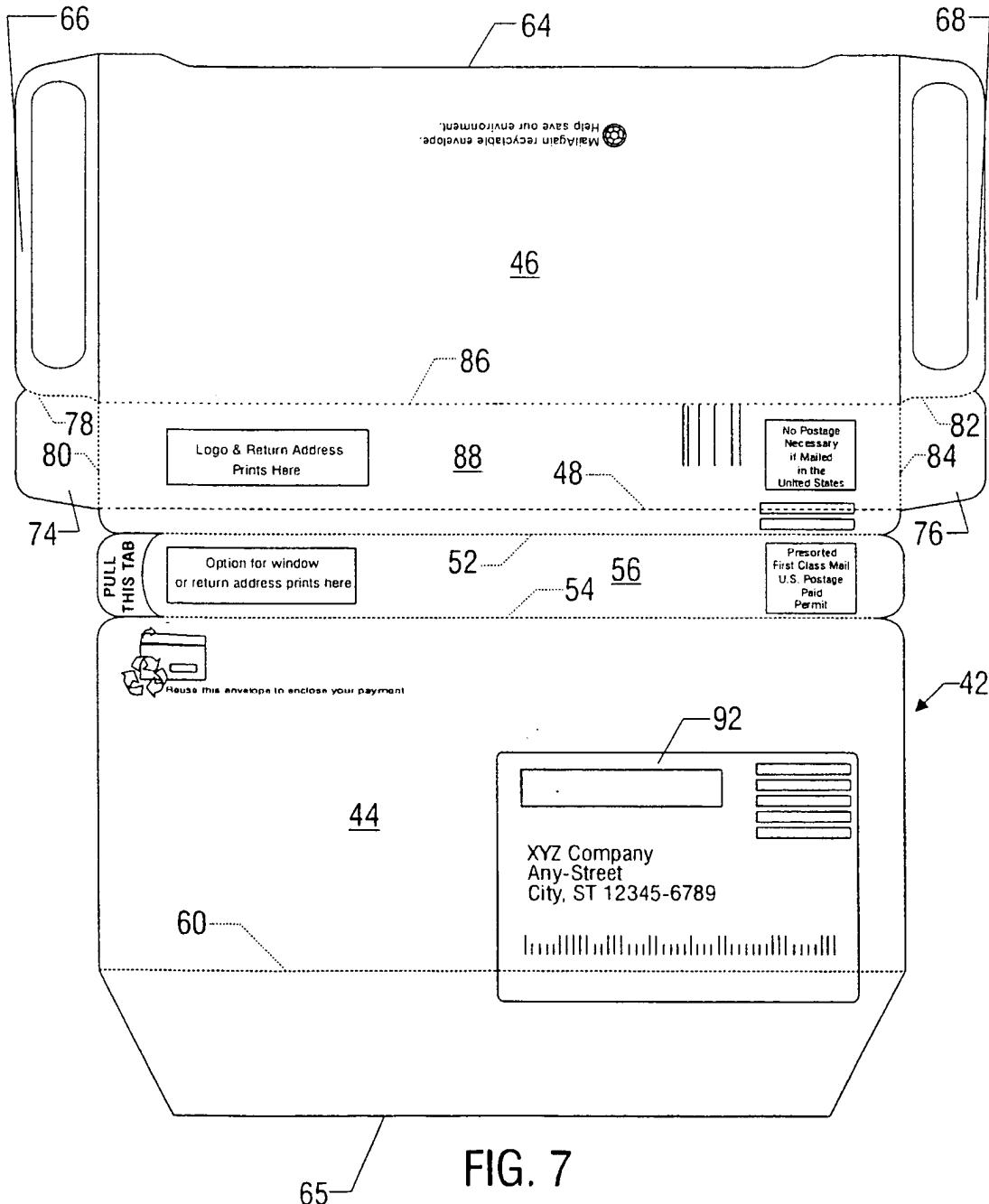


FIG. 5

6/11



7/11



8/11

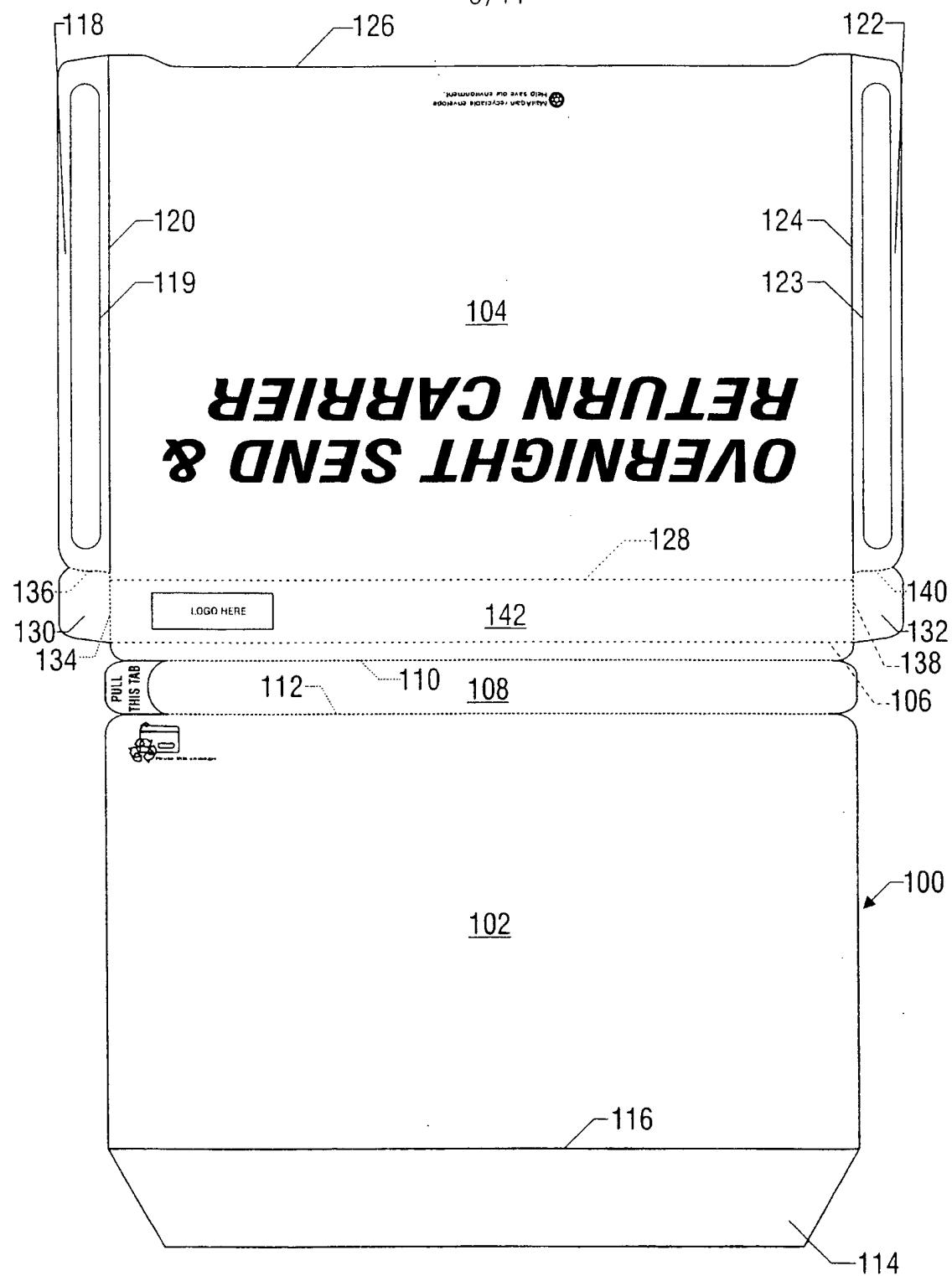


FIG. 8

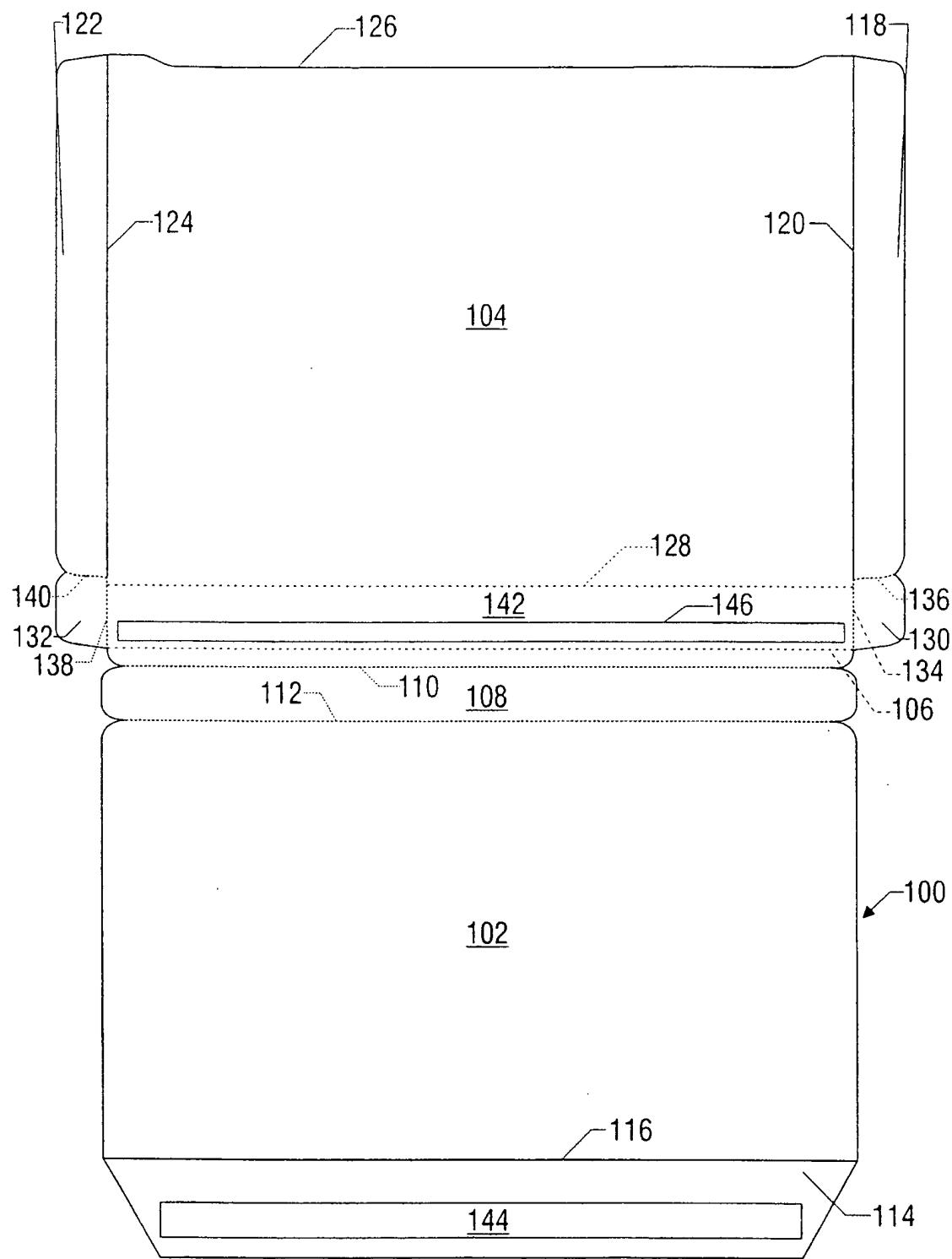


FIG. 9

10/11

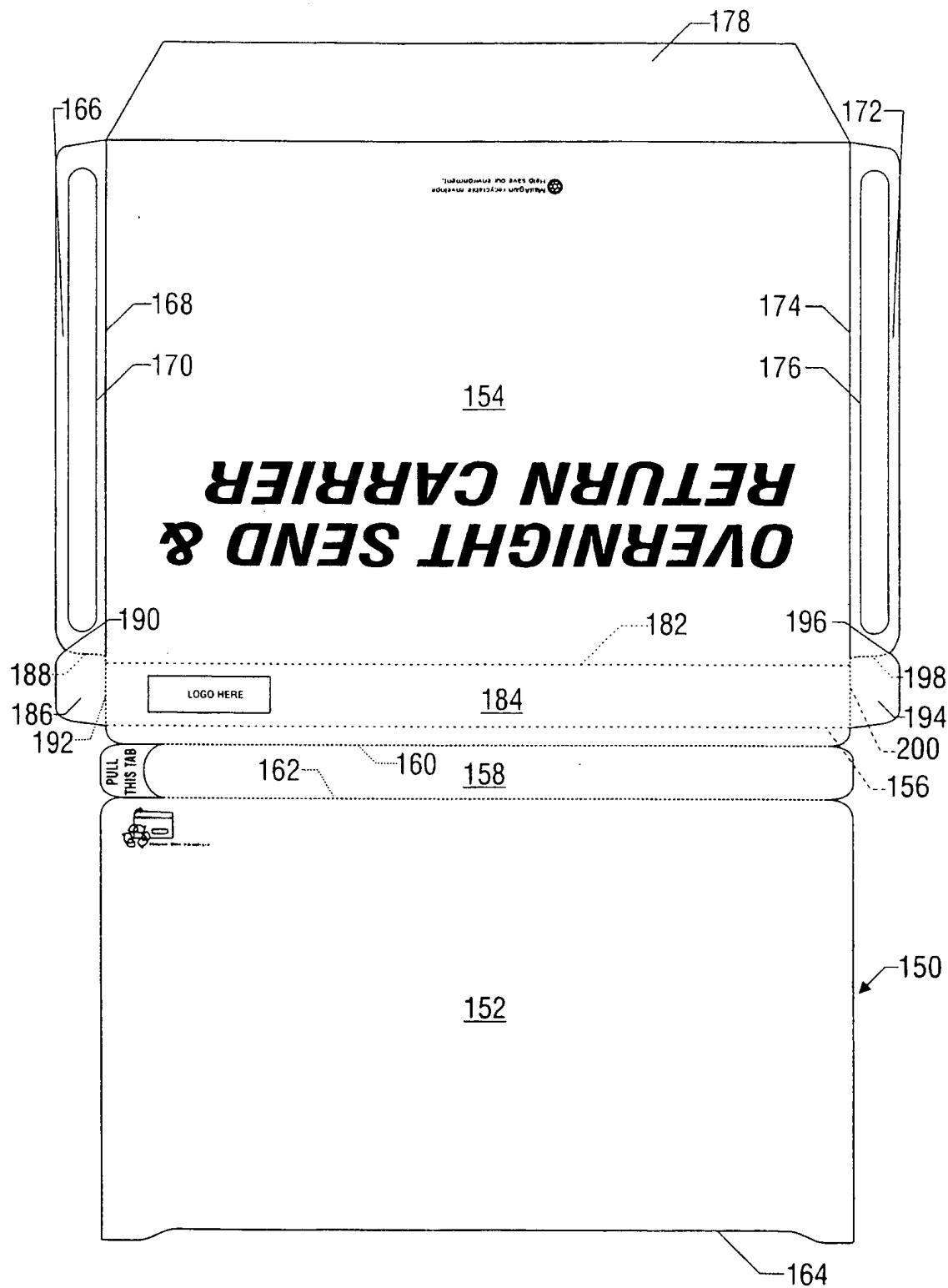


FIG. 10

11/11

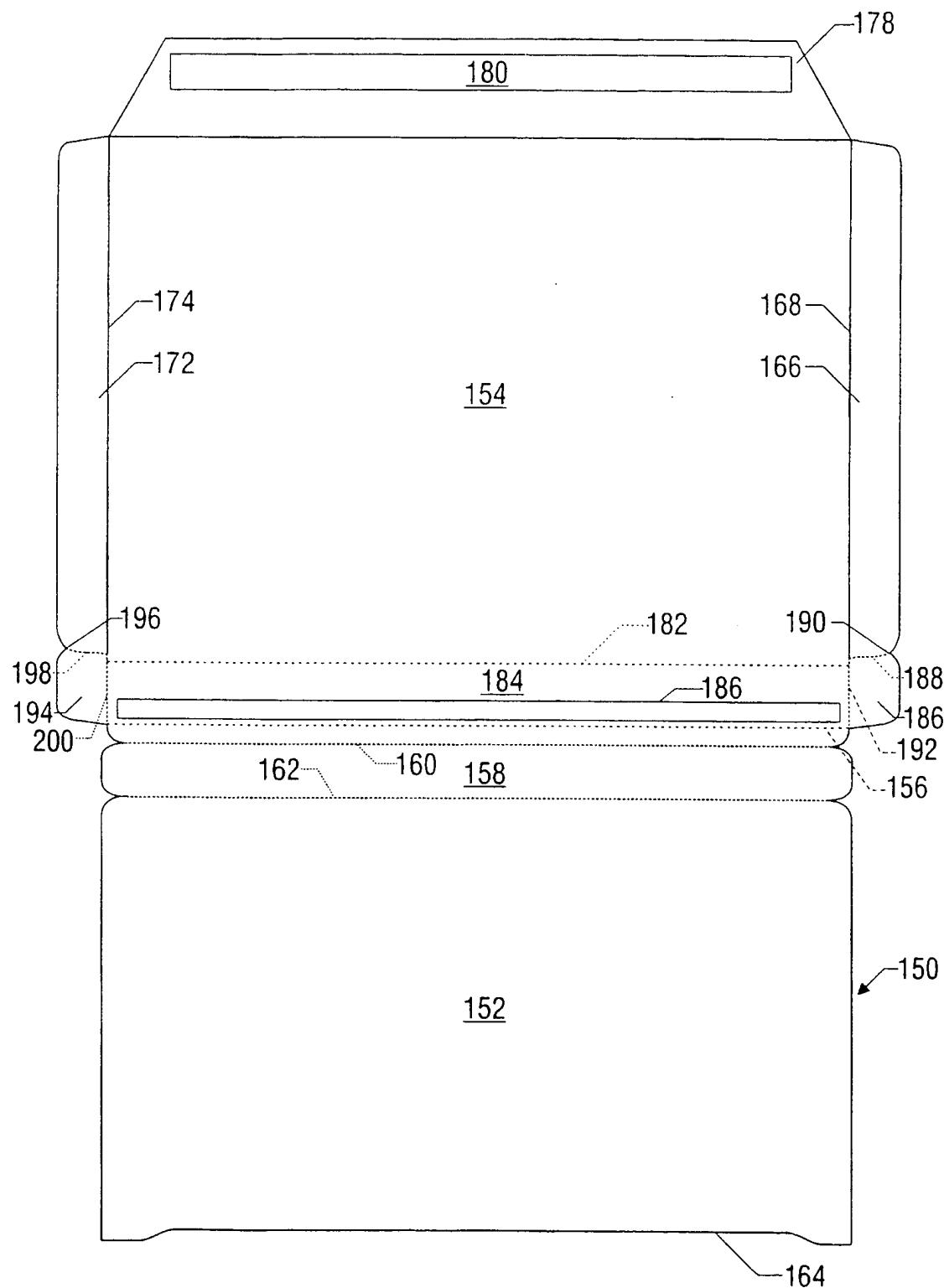


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US99/19129

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B65D 27/06

US CL :229/301, 303, 314

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 229/301, 303, 314

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,775,095 A (EMMOTT) 04 October 1988, see Figs. 2 and 5-9 and col. 5, lines 11-15.	1-13
A	US 1,438,122 A (MCCOY) 05 December 1922	
A	US 3,152,751 A (HIERSTEINER) 13 October 1964	
A	US 3,111,257 A (PEACH) 19 November 1963	
A	US 3,498528 A (KLEIN) 03 March 1970	

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	*T*	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*&*	document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means		
P document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

29 SEPTEMBER 1999

Date of mailing of the international search report

20 OCT 1999

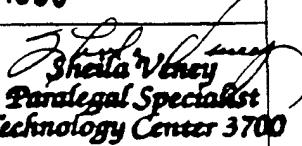
Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

STEPHEN GARBE

Telephone No. (703) 308-1207



 Sheila Veney
 Paralegal Specialist
 Technology Center 3700